

Appln No. 10/680,706
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Reply to Office action of May 31, 2007

Amendments to the Drawings:

The attached sheets of drawings include FIGS. 1-5 and new FIGS. 6 and 7. These sheets, which include FIGS. 1-7, replace the original sheets including FIGS. 1-5.

Attachment: Replacement Sheets
 Annotated Sheets Showing Changes

REMARKS/ARGUMENTS

Claims 1, 3-5, 7, 8, 10-23 and 27-32 were previously pending in the application. Applicants have presented new claims 33-42 and cancelled claims 28-31. Therefore, claims 1, 3-5, 7-8, 10-23, 27 and 32-42 are pending the present application.

On August 31, 2007, Applicants' attorney, Saeid Mirsafian, conducted a telephone interview with Examiner Woodall. Claims 1, 4, 17, 27 and 32 were discussed. In particular, rejection of claim 27 over Tronzo (U.S. Patent No. 4,940,467), rejection of claims 1 and 17 over Anderson (U.S. Patent 5,030,052) in view of Chappius (U.S. Publication No. 2001/0021852), rejection of claims 4 and 17 over Tronzo in view of Chappius, and rejection of claims 1 and 32 over Kambin (U.S. Patent No. 5,964,761) in view of Chappius were discussed. No agreement was reached, but the Examiner indicated that he would reconsider the claims based on the interview. Applicants would like to thank the Examiner for his time and effort in conducting the telephone interview.

The drawings have been objected to for not showing an interference fit as recited in claim 4 and that the thread section comprises a stop located inside the outer wall as recited in claim 8. Applicants have provided new drawing sheets that include new FIGS. 6 and 7, which show the stop located inside the outer wall and the interference fit, respectively. Applicants request that the objection to the drawings be withdrawn.

Claim 27 has been rejected under 35 U.S.C. 102(b) over Tronzo (U.S. Patent No. 4,940,467). Applicants have amended claim 27 to recite wherein the connecting element and the first section both are fixed to each other on the threaded surfaces so as to form a press fit. In contrast, Tronzo does not teach or suggest the noted limitation of claim 27.

Referring to FIGS. 2 and 3 of Tronzo, a screw portion 30 with a hexagonally-shaped outer surface 42 mates with hex-shaped inner surface 16 of barrel portion 11, such that when the two portions 11 and 30 are joined, relative axial rotation between the two is prevented. The mating relationship between surfaces 16 and 42 is such that axial relative movement between

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portions 11 and 30 is uninhibited. Accordingly, the portions 11 and 30 of Tronzo are not fixed to each other along unthreaded surfaces so as to form a press fit, because portions 11 and 30 can axially move relative to each other.

Because Tronzo does not teach or suggest that the connecting element and the first section both are fixed to each other along unthreaded surfaces so as to form a press fit, as recited in claim 27, Applicants believe that claim 27 is patentable over Tronzo.

Claims 1, 3, 5, 7, 8, 10-12, and 14-20 have been rejected over Anderson (U.S. Patent 5,030,052) in view of Chappius (U.S. Publication No. 2001/0021852).

Anderson is directed to ties for building structures. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). The tie of Anderson in the field of building structures as indicated by the U.S. Classification numbers listed on the face of Anderson. Thus, Anderson is not in the field of bone screws or surgery. Furthermore, the tie of Anderson is not pertinent to the problem being solved by the bone screw of the present application. The bone screw of the present application is used in bone surgery where the bone screw is attached to a bone. In contrast, the tie of Anderson is pertinent to the problem of securing a wall structure such as a house wall to a wooden structure such as a floor or roof. Applicants submit that a tie for connecting building structures is not pertinent to a bone screw for bone surgery, because the environments in which they are used are significantly different and unrelated. Therefore, Applicants submit that one of ordinary skill in the art of designing, testing and/or manufacturing bone screws would not consider the building tie of Anderson in solving problems associated with bone surgery and bone screws used in bone surgery.

Claim 1 has been amended to recite that the thread section is suitable for implanting in a living body (*See Specification*, page 8, 3rd paragraph), and the holding element further comprises a stop configured as an annular projection fixedly provided on the holding element. In contrast, Anderson and Chappius do not teach or suggest the noted limitations of claim 1.

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Anderson is directed to ties for building structures. Anderson teaches a tie bolt 10 that can be connected to two adjacent wall structures as shown in FIGS. 1, 3 and 4 of Anderson. In contrast to claim 1 of present application, the threaded components of the tie bolt of Anderson are designed so as to be suitable for connecting to building materials. Therefore, Applicants submit that Anderson does not teach or suggest a thread section that is suitable for implanting in a living body as recited in claim 1.

Furthermore, with reference to FIG. 2 of Anderson, the tie bolt 10 includes a threaded rod 12, a spacer tube or sleeve 14, a threaded forward component 16 and a threaded rear component 18. The spacer tube 14 fits closely over the rod 12. The threaded component 16 has a pointed end 20 and at its opposite end a tapped bore 22. The rear threaded component 18 has a tapped bore 24 to receive the rod 12 at one end and a head receiving tapped bore 26 at the other end. The rod 12 and the sleeve 14 are cut to the required length. The end 28 of the rod is then screwed into the tapped bore 22 of the component 16. The spacer tube 14 is then placed over the rod and the component 18 is screwed onto the end 30 of the rod. According to Anderson, the sleeve 14 is placed over the rod 12, hence it is moveable over the rod 12 so as to provide space between the threaded components 16 and 18. Anderson does not teach or suggest an annular projection fixedly providing on the holding element located between the first section and the second section to prevent further penetration of the holding element into the thread section. As described, the sleeve 14 of Anderson is moveably provided on the rod 12. Therefore, Applicants believe that Anderson does not teach or suggest that the thread section is suitable for implanting in a living body, and that the holding element further comprises a stop configured as an annular projection fixedly provided on the holding element, as recited in claim 1.

Chappius is directed to a surgical screw which includes a plurality of dispersion holes 24 for dispersing medical adhesive or bonding cement 26 into a healing bone. The Examiner has relied upon Chappius for having the plurality of dispersion holes 24 to reject claim 1 in combination with Anderson. However, Chappius also fails to provide the above-discussed limitations which are not taught or suggested by Anderson. Furthermore, claim 1 has also been amended to recite wherein an outer diameter of the holding element is less than or equal to an

outer diameter of the thread section. In contrast, Chappius does not teach or suggest a holding element wherein the outer diameter of the holding element is less than or equal to the outer diameter of the thread section.

For the foregoing reasons, Applicants believe that claim 1 is patentable over Anderson in view of Chappius.

Applicants have amended claim 17 to recite a thread section of a one piece elongated tubular construction with an outer wall and having a first open end extending through the elongated tubular construction to a second open end. Applicants have further amended claim 17 to recite that the thread section is suitable for implanting in a living body. In contrast, Anderson and Chappius do not teach or suggest all of the noted limitations of claim 17.

As shown in FIG. 2 of Anderson, the threaded component 16 and 18, and the rod 12 do not have a one piece elongated tubular construction with an outer wall and having to first open and extending through the elongated tubular construction to a second open end. Furthermore, as discussed above in the relation to the rejection of claim 1, the threaded components 16 and 18 of Anderson are designed for connection to construction materials, and therefore, are not suitable for implanting in a living body. Therefore, Anderson fails to teach or suggest the above discussed limitations of claim 17.

In rejecting claim 17, the Examiner has relied upon Chappius for having the plurality of dispersion holes 24 to reject claim 17 in combination with Anderson. However, Chappius also fails to provide the above-discussed limitations which are not taught or suggested in Anderson. In particular, the surgical screw of Chappius is closed at both ends. Therefore, Chappius also fails to teach or suggest a thread section of a one piece elongated tubular construction with an outer wall and having a first open end extending through the elongated tubular construction to a second open end. Furthermore, claim 17 has been amended to recite wherein the diameter of said section free of bone thread is less than or equal to the diameter of the thread section. In contrast, Chappius does not teach or suggest a section free of bone thread wherein the diameter of such a section is less than or equal to the diameter of the thread section.

For the foregoing reason, Applicants believe that Claims 1, 3, 5, 7, 8, 10-12, and 14-20 are patentable over Anderson in view of Chappius.

Claim 13 has been rejected under U.S.C. 103(a) as being unpatentable over Anderson in view of Chappius and further in view of Forman (U.S. Patent 2,993,950). Because claim 1 is patentable over Anderson in view of Chappius, claim 13 is also patentable over Anderson in view of Chappius and further in view of Forman.

Claims 4, 17, and 21 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tronzo in view of Chappius. Claim 4 has been amended to recite wherein the second end of the thread section and the first section of the holding element are fixed to each other along unthreaded surfaces so as to form a press fit. As discussed above in relation to the rejection of claim 27, Tronzo does not teach or suggest that the second end of the thread section and the first section of the holding element are fixed to each other along unthreaded surfaces so as to form a pressed fit. In Tronzo, the mating relationship between surfaces 16 and 42 is such that axial relative movement between portions 11 and 30 is uninhibited. Accordingly, the portions 11 and 30 of Tronzo are not fixed to each other along unthreaded surfaces so as to form a press fit, because portions 11 and 30 can axially move relative to each other. Therefore, Applicants believe that claim 4 is patentable over Tronzo in view of Chappius.

Claim 17 has been amended to recite a thread section of a one-piece elongated tubular construction with an outer wall and having a first open end extending through the elongated tubular construction to a second open end, a tip connectable to the first open end, and an engagement element at the second open end capable of cooperating with a screw-in tool. In contrast, Tronzo and Chappius do not teach or suggest the noted limitations of claim 17.

Referring to FIG. 2 of Tronzo, neither does the screw portion 30 nor does the barrel portion 11 is constructed of a one-piece elongated tubular construction with an outer wall having a first open end extending through the elongated tubular construction to a second open end. Furthermore, Tronzo does not teach or suggest a tip connectable to the first open end and an engagement element at the second open end capable of cooperating with a screw-in tool. With regard to Chappius, the surgical screw of Chappius does not have a first open end extending

through the elongated tubular construction to a second open end and a tip connectable to the first open end and an engagement element at the second open end capable of cooperating with a screw-in tool. Therefore, Applicants believe that claim 17 is patentable over Tronzo in view of Chappius. Claim 21 depends on claim 17, and therefore is patentable over Tronzo in view of Chappius.

For the foregoing reasons, Applicants believe that Claims 4, 17, and 21 are patentable over Tronzo in view of Chappius.

Claims 1, 22, 28, and 30-32 have been rejected under 35 U.S.C. 103(a) over Kambin (U.S. Patent No. 5,964,761) in view of Chappius. Applicants have canceled claims 28-31. Claim 1 has been amended to recite that the holding element further comprises a stop configured as an annular projection fixedly provided on the holding element. In contrast, Kambin and Chappius do not teach or suggest an annular projection fixedly provided on the holding element as recited in claim 1.

Referring to FIGS. 6-8 of Kambin, the pedicle screw 58 has a shaft 60 with a distal portion 62 with threads, a centrally located head 64 for engagement by a wrench, and a proximal portion 66 having machine screw threads 68. A tubular extension 70 has internal threads 72, which are engaged with threads 68, so that rotation of the extension relative to the pedicle screw shaft 60, causes the extension to move lengthwise in one direction or the other, thereby increasing or decreasing the effective length of the pedicle screw 58. As shown in FIG. 8, the threaded recess 76 of the extension 70 is engageable with threads 86 of an adaptor 88. The threads 86 extend downward from a plate 90. The plate has notches 92 and 94 for engagement by a special wrench used to tighten it into secure engagement with the extension 70.

In Kambin, the threads 86 of the adaptor are secured in the recess 76 of the extension 70. Then the plate 90 is turned with wrench so as to tighten the plate 90 is secured to the extension 70. Accordingly, the plate 90 turns on the threads 86 and is not fixed to the threads 86. Thus, in contrast to claim 1, if the adaptor 88 is considered a holding element and the plate 90 is considered a stop, the plate 90 is not configured as an annular projection fixedly provided on the holding element.

Furthermore, claim 1 recites a thread section of elongated tubular construction wherein the tubular thread section further comprises a bone thread on the outer wall and wherein the holding element further comprises a stop configured as an annular projection fixedly provided on the holding element located between the first section and the second section to prevent further penetration of the holding element into the thread section. If the extension 70 of Kambin is considered a holding element, then the extension 70 does not comprise a stop configured as an annular projection fixedly provided on the holding element. Also, the extension 70 does not penetrate the distal portion 62. Additionally, the outer diameter of the extension 70 is not less than or equal to an outer diameter of the distal portion 62. If the distal portion 62 of Kambin is considered a holding element and the extension 70 is considered a thread section of the elongated tubular construction, then the extension 70 does not have a bone thread on its outer wall.

The Examiner has relied upon Chappius for having the plurality of dispersion holes 24 to reject claim 1 in combination with Kambin. However, Chappius also fails to provide the above-discussed limitations which are not taught or suggested by Kambin. Furthermore, claim 1 has also been amended to recite wherein an outer diameter of the holding element is less than or equal to an outer diameter of the thread section. In contrast, Chappius does not teach or suggest a holding element wherein the outer diameter of the holding element is less than or equal to the outer diameter of the thread section.

For the foregoing reasons, Applicants believe that claims 1 and dependent claim 22 are patentable over Kambin in view of Chappius.

Applicants have amended claim 32 to recite a thread section of elongated tubular construction with an outer wall and having a first open end extending through the elongated tubular construction to a second open end, wherein the tubular thread section further comprises a bone thread on the outer wall, and wherein an outer diameter of the holding element is less than or equal to an outer diameter of the thread section. In contrast, Kambin and Chappius do not teach or suggest the noted limitations of claim 32.

Refereeing to FIGS. 6-8 of Kambin, the threaded distal portion 62 of Kambin is not elongated tubular construction with an outer wall and having the first open end extending

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through the elongated tubular construction to a second open end. If the extension 70 of Kambin is considered a thread section of an elongated tubular construction as recited in claim 1, then the extension does not have a bone thread on the outer wall. Chappius also fails to teach or suggest a thread section of elongated tubular construction with an outer wall and having a first open end extending through the elongated tubular construction to a second open end. Furthermore, Chappius does not teach or suggest that an outer diameter of the holding element is less than or equal to an outer diameter of the thread section. Thus Applicants believe that claim 32 is patentable over Kambin in view of Chappius.

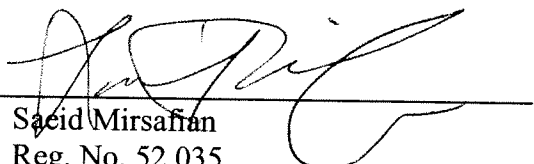
Applicants have presented new method claim 37 and dependent claims 38-42. Claim 37 is directed to a method of attaching a bone screw as recited in claim 1. As discussed in the foregoing, claim 1 is patentable over the applied references. Therefore, Applicants believe that claim 37 and dependent claims 38-42 are also patentable over the applied references.

In view of the above, Applicants believe that claims 1, 3-5, 7-8, 10-23, and 32-42 are in condition for allowance.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By


Saïd Mirsaïan
Reg. No. 52,035
626/795-9900

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